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Diversified Risk Management

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Abstract

Risk is considered a phenomenological variable, which makes it interesting to investigate in terms of how people understand the term. However, if a risk is equated to a threat, it relates mainly to the uncertainty and variability of the results of specific actions. A prevention or mitigation system for possible effects of threat should be created by taking into account experience and the dynamics of the development of threats to safety at the international, regional, national and local levels. Such a system should be based on the rules of risk management in crisis situations.

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Keywords: Security, Risk, Management, Crisis situation

1. Introduction

Each decision is associated with predicting a given state in the future. Unfortunately, one can never be absolutely sure how particular factors influencing a decision will develop in the future. In this sense, risk means that today's decision might not bring the expected results in the future (Tarczyński, 2001).

Everyday risk can result from various factors. It might be the result of predetermined conditions such as biological factors. A substantial source of risk in everyday life is the improper behaviour of others. They increase the number of victims of road accidents and also accidents at home and at work. This is not always related to the individual or local dimension. Sometimes these are threats referring to large numbers of people, such as epidemiological risks, the risk related to consuming genetically modified food, and ecological risk, and also the risk of a military conflict or war.

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In the historical perspective, risk has always been associated with the actions of individuals and entire communities. As early as around 3200 years B.C. in the valley of the Tigris and the Euphrates there was a social group called Asipu who provided advice to people making risky, uncertain and difficult decisions. The Greeks and the Romans observed the causal relationship between environmental conditions and the state of health of the citizens. In the 4th century BC Hippocrates noticed the risk to human health arising from external factors, and in the 1st century BC Vitruvius discovered that lead is toxic. Finally, in the 16th century Agricola described the effects of working in a coal mine on the miner's health.

The examples provided demonstrate that in the past the major focus was on risks related to human life and health. However, later, risks in other areas of human activity were perceived. In 1657 Pascal formulated the probability theory, and in 1693 Edmond Halley developed the life-expectancy table. In 1972 Pierre Simon de Laplace developed a prototype of the contemporary quantitative methods of risk analysis, including the estimation of the probability of survival after the application of the smallpox vaccination and without it. Evelyn (1620-1706), by observing the environment and the state of health of London residents, found that smoke and smog cause lung diseases; he also proved that soot was the cause of cancer in chimney sweeps.

The development of capitalism, and the widespread use of money and interest, triggered the application of mathematical methods in relation to risk and probability categories, and developing and disseminating the life-expectancy table was a methodological breakthrough for insurance companies (Kaczmarek, 1999).

The development of an enterprise involves uncertainties and danger, but it also creates opportunities. Risk management primarily aims to identify threats and opportunities. The determination of the extent of impact of diversified risk on the enterprise is of pivotal importance (Kaczmarek, 2008).

2. Risk management

Risk management can be defined as making decisions in a way that ensures the highest level of security by reducing the impact of anticipated factors on the functioning economic entity. Therefore, risk management focusses on the prevention and mitigation of losses.

The concept of risk management should constitute an inseparable part of an enterprise’s development strategy. Once drawn up, it will make it possible to plan the organisation’s performance taking into account risk factors, and to monitor the extent of the impact of these factors on the broadly-defined financial performance and financial standing (Sienkiewicz, 2006).

Risk management is aimed at the complete elimination or, at least, the mitigation, of causes and/or the effects of events that can disrupt the organisation’s economic processes, resulting in a crisis.

There are two phases of risk management:

- Risk analysis (identification, estimation, evaluation) (Sienkiewicz, 2006)
- Risk management (planning, control, monitoring).

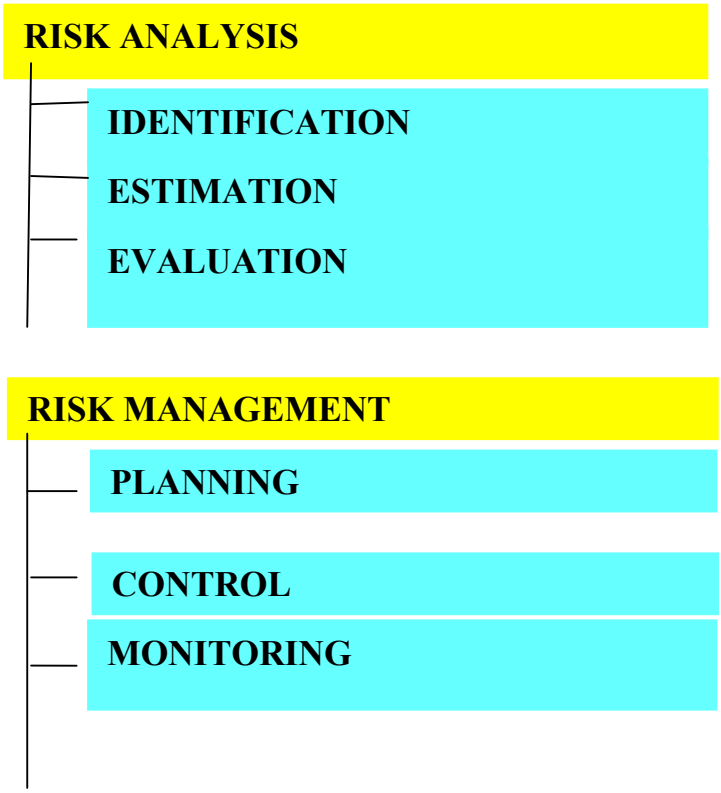

Figure 1. Risk analysis, Risk management

Risk identification is the recognition of all possible risks, including all types of threats, their causes, place and time of occurrence, and consequences. This requires an in-depth knowledge of the organisation, the market in which it operates, and also of its legal, social, political and cultural environment. While identifying risks, it is necessary to describe them, and thus present the characteristics of the threats in a structured way, in order to allow their comparison and weighting.

The process of risk identification can entail the following techniques: brain-storming; questionnaires; business analyses, which by discussing specific areas of activity describe internal processes and external factors, which can influence these processes; comparisons with model solutions in a given industry; scenario analyses, workshops in risk assessment; case studies; audits and controls; SWOT analysis, PEST analysis.

Risk estimation is a key issue in risk analysis, determining the appropriate approach risk. The measurement of risk (effect probability) can be qualitative and quantitative. Risk estimation can be based on probabilistic and statistical methods; sensitivity analysis methods; profile analyses; scenario methods; and operational methods. To create (construct) risk matrices we can use security models.

Tab. 1. Five-point risk level estimator (Polish Standard PN-N-18002)

Probability	Severity of consequences		
	Moderate	Medium	Extreme
Fairly improbable	Very slight	Moderate	Medium
	1	2	3
Probable	Moderate	Medium	High
	2	3	4
Highly probable	Medium	High	Extreme
	3	4	5

Three-point method

Tab. 2. Three-point risk level estimator (Polish Standard PN-N-18002)

Probability	Severity of consequences		
	Moderate	Medium	Extreme
Fairly improbable	Very Slight 1	Slight 1	Medium 2
Probable	Slight 1	Medium 2	High 3
Highly probable	Medium 2	High 3	Very High 3

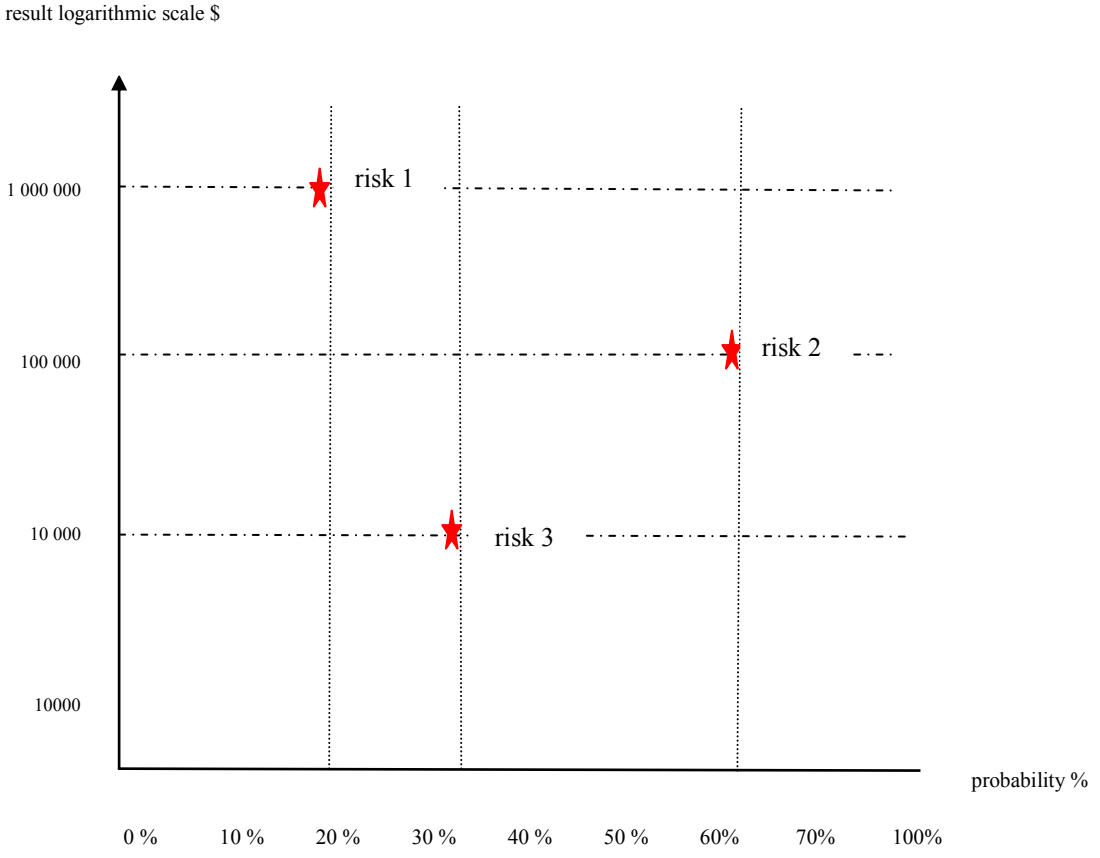

Figure 2. A sample risk map

Risk maps can be supplemented by the use of colours, which can be put on such maps and warn people, like traffic lights.

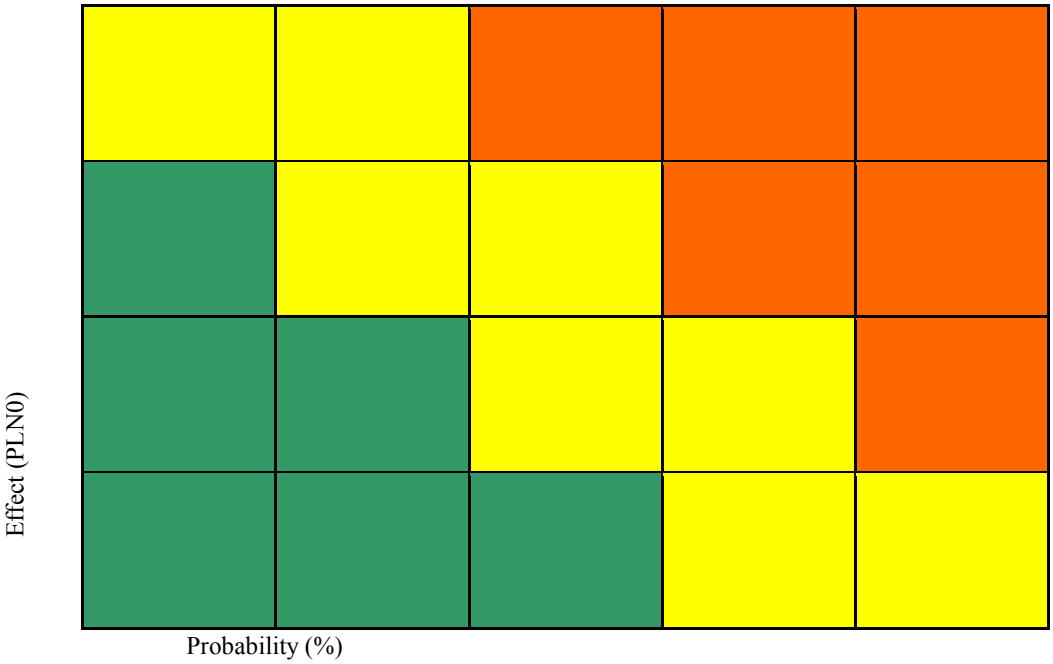

Figure 3. Risk maps

Risk **evaluation** consists of the comparison of estimated risk values, resulting from its estimation, with the criteria adopted by the organisation. Necessary conditions are specified to aknowledge the level of estimated risk.

Planning consists of the determination of the acceptable levels of particular risks (even before risk analysis), and the determination of its being possible to manage different risk types.

Control means here systematic inspection of the implementation of the adopted risk-management plan through risk verification. It also includes monitoring whether the indicators of acceptable risk levels have been exceeded, and making adjustments in the event of a change in risk assessment.

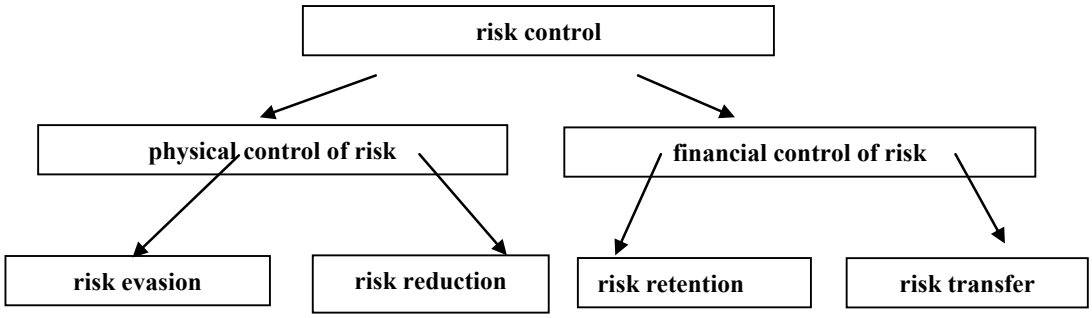

Figure 4. Risk control

Monitoring is a process consisting of investigating whether appropriate control mechanisms are in place in the organisation, and whether procedures are being observed (correct risk identification and evaluation, appropriate solutions in respect of risk procedures). In practice, this takes place by the temporary division of risk-management rules and their compliance with adopted standards (Bugol, Jedynak, 2012).

Risk assessment is a process of analysing and determining the acceptability of risks. It is the result of logical steps made in systematic and systemic research of threats and hazardous events. As a result of such research, actions aimed at risk mitigation are undertaken where it is actually necessary. This process is subject to iteration (the act of the step-by-step repetition of research) in the risk management algorithm. Next, if necessary and practicable, threats are eliminated or mitigated by way of undertaking measures eliminating or mitigating risks (Romanowska - Słomka, Słomk, 2012).

Risk analysis is concluded by providing the required information necessary to determine the level of the risk. Based on this information, risk evaluation is performed, i.e. the level (value) of the risk is determined.

Scientists investigating the issue of risk have at their disposal concepts, definitions and methods suitable also for the individual researcher. They focus their scientific work on the formal aspects of research, and employ scientific methods compatible with the applicable criteria. Furthermore, they must have appropriate knowledge of the methods used in this field of study. However, while studying risks and crisis situations, one cannot only stick to the criteria of formal logic and disregard such methods as deduction or induction (Kaczmarek, Ćwięk 2009).

3. Summary

In deductive methods the reasoning process consists of going from the general to the specific, i.e. it is a mental process in which, mainly on the basis of the global information, we can reach conclusions on some of its constituents (elements, items). Therefore, it is a mental process based on the assumption of basic rules (premises or axioms), whose legitimacy is acknowledged without reservation, followed by a process of reasoning based on the rules of logic and leading to more specific conclusions (Apanowicz, 2003).

In inductive methods the reasoning process consists of drawing conclusions from premises forming particular cases. Broadly speaking, it is reasoning from the specific to the general. On the basis of information on some items (processes, events) of a given class, we can reach conclusions on all items.

For the sake of the accuracy of risk assessment, we can distinguish between quantitative and qualitative methods.

Quantitative research consists of a quantitative description and analysis of facts, phenomena and processes. These can be presented in the form of various juxtapositions and calculations, taking into account descriptive and mathematical statistics.

Qualitative research consists of analysing target phenomena, highlighting elementary constituents, detecting the relationships and interrelations between them, and of specifying their holistic structure (Łobocki, 2008). The notion of interdisciplinary risk management includes pursuing a policy relating to risk in various fields of human activity. The adjustment of one's concept to the given conditions is an important issue in risk management. Another

important factor is the distribution of clearly-defined responsibilities among managers concerning the management of the particular sections and divisions of the enterprise. It is necessary to take into account the existing management model – centralised or decentralised. Furthermore, the establishment of a risk early-warning system is another extremely important matter. Taking the above into consideration, risk management is a logically-arranged collection of rules and regulations, which are constantly and uniformly implemented in respect of the risks entailed with the conducted activities (Kaczmarek, 2008).

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